AMENDED CLAIMS

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Original claims 1 to 22 amended
original claims 23 to 32 unchanged
(7 pages)

Claim

1. A method for controlling web tensions in a multi-web system, wherein initially two webs (B1, B2, B3, B4) each pass separately through at least one processing step (03) and a following traction element (05) in order to be subsequently combined into a strand (13), and wherein a tension and/or the course of a tension of the individual web (B1, B2, B3, B4) by itself, as well as the tensions in the webs (B1, B2, B3, B4) prior to being combined (B1, B2, B3, B4), are controlled in relation to each other, characterized in that the control of the tension in the at least two webs B1, B2, B3, B4) in respect to each other in a first control process (19), and the control of the tension of the individual webs (B1, B2, B3, B4) each for itself are performed in two control processes (19, 18.x) which are separate from the first control process (19), wherein the first control process checks the tensions in the webs (B1, B2, B3, B4) in respect to each other and, in case of a deviation, outputs at least one preset value for a web tension to at least one of the

second control processes (18.x), by means of which the tension in the individual webs (B1, B2, B3, B4) by itself is controlled by means of at least one actuating member (02, 05, 16).

2. A method for the control in a press which processes or works on paper, wherein a parameter (S) is controlled via an actuating member (02, 05, 16) by a control system (17) in connection with at least one measured value (Sx.3) by means of a prescription and/or a characteristic diagram, characterized in that in a first control process a preset value for the parameter is generated by means of a first prescription and/or a first characteristic diagram, that this preset value is supplied to a second control process (18), which is operated by fuzzy logic, and that a change in the position and/or form of at least one term of a

linguistic description of a fuzzyfication is caused in the second control process (18) by means of the preset value.

3. The method in accordance with claim 2, characterized in that by means of the control system (17) having the two control processes (18, 19), which are different from each other, parameters of a multi-web system representing web tensions (S) are controlled, wherein a control task respectively directed to a single web (B1, B2, B3, B4) is generated by means of the second control processes (18), and the preset value for the first mentioned second control process (18) is created by means of the first control process (19), and a control task directed to all webs (B1, B2, B3, B4) to be brought together is processed in that an actuating value (Sx.11, Sx.12) is supplied to an actuating member (02, 05, 16) acting on the individual webs (B1, B2, B3, B4) only by the second of the two control devices (18), and a preset value of the first control process (19) causes the change in the position and/or form of at least one term for the linguistic description of the fuzzyfication in the second control process (18).

4. The method in accordance with claim 1, characterized in that action on an actuating member (02, 05, 16) assigned to the individual web (B1, B2, B3, B4) is performed only by the second (18.x) of the two control processes (18.x, 19).

5. The method in accordance with claim 1 or 3,

characterized in that the first control process (19) does not have a direct influence on the actuating members (02, 05, 16) assigned to the individual webs (B1, B2, B3, B4), but instead provides preset desired values of the tension to be maintained prior to the bringing together of each of the webs (B1, B2, B3, B4) by means of its characteristic diagram from values (S1.3 to S4.3) of the tensions measured prior to the bringing together.

6. The method in accordance with claim 5, characterized in that these preset desired values are compared in the second control process (18.x) with the last valid preset desired values and, in case of a deviation, it is taken into consideration in the course of the determination of new actuating values (Sx.11, Sx.12) for at least one actuating member (02, 05, 16) assigned to the individual web (B1, B2, B3, B4).

7. The method in accordance with claim 5 or 6, characterized in that, as a result of a deviation between the new and the previous preset desired values detected in the control process (18.x), the position and/or form of a term in the allocation diagram of a fuzzyfication is changed.

8. The method in accordance with claim 1 or 3, characterized in that per web (B1, B2, B3, B4) to be brought together, its web tension on its web path is controlled by its own second control process (18), which is different from the first control process (19).

9. The method in accordance with claim 1 or 3, characterized in that the actual web tensions (S1.3, S2.3, S3.3, S4.3) of the individual webs (B1, B2, B3, B4) prior to their coming together is supplied to the first control process (19) as input values, and the latter generates from this and a logic implemented in the control process (19) preset values of the web tensions (S1.3, S2.3, S3.3, S4.3) of

the individual webs (B1, B2, B3, B4) prior to their coming together).

10. The method in accordance with claim 9, characterized in that the preset values are determined in accordance with a prescription, in accordance with which the further inward located one of two webs (B1, B2, B3, B4) running up on a hopper inlet roller (08) should have a higher or minimally identical web tension.

11. The method in accordance with claim 9, characterized in that the first control process (19) presets a desired value for an actuating member (08, 10) working together with the strand (13).

12. The method in accordance with one of the preceding claims, characterized in that the first control process (19) is operated using fuzzy logic.

13. The method in accordance with claim 1 or 3, characterized in that the actual web tension (S1.3, S2.3, S3.3, S4.3) of the individual webs (B1, B2, B3, B4) prior to their coming together, as well as the actual web tension (S1.2, S2.2, S3.2, S4.2) downstream of the processing stage (03) designed as a printing unit (03), is provided to the second control process (18) as input values, and the latter generates from this and a logic implemented in the control process (18) a preset value of the web tension (S1.1, S2.1, S3.1, S4.1) of the individual web (B1, B2, B3, B4) upstream of the printing unit (03).

14. The method in accordance with claim 13, characterized in that in addition a preset value of the web tension (S1.1, S2.1, S3.1, S4.1) of the individual web (B1, B2, B3, B4) downstream of the printing unit (03) is generated.

15. The method in accordance with claim 13 or 14,

characterized in that the preset values are determined in accordance with a prescription in accordance with which the web tension directly downstream of the printing unit (03) and prior to the bringing together does not fall below a minimum tension and does not exceed a maximum tension.

16. The method in accordance with claim 13 or 14, characterized in that the preset values are determined in accordance with a prescription in accordance with which the web tension in the area of a measuring location (04) directly downstream of the printing unit (03) and a measuring location

(06) prior to the bringing together is intended to lie within a tolerance range specified for this measuring location (04, 06).

17. The method in accordance with claim 13, characterized in that a preset value of the web tension (S1.3, S2.3, S3.3, S4.3) of the individual webs (B1, B2, B3, B4) prior to being brought together is supplied to the second control process (18) by the first control process (19).

18. The method in accordance with claim 1, characterized in that the second control process (18) is operated using fuzzy logic.

19. The method in accordance with claim 13 and 14, characterized in that the preset value from the first control process (19) causes a change of the position and/or form of at least one term for the linguistic description of the fuzzification in the second control process (18).

20. The method in accordance with claim 1 or 3, characterized in that preset values for web tensions are transmitted to at least one of the control devices (18, 19) prior to or no later than the start-up of the processing press.

21. The method in accordance with claim 1 or 3, characterized in that the run through the two control processes (18x, 19) occurs parallel and each by itself in

loops.

22. A device for controlling web tensions in a multi-web system with a control system (17) for setting the web tension of at least two webs (B1, B2, B3, B4), which are to be brought together after passing a processing stage (03), characterized in that the control system (17) has a first

control device (19) and two second control devices (18) which are different from the first control device (19), that the second control devices (18) are designed for performing a control task directed to a single web (B1, B2, B3, B4) by means of measured values of the web tension of a single web (B1, B2, B3, B4), and the first control device (19) is designed to perform a control task directed to all webs (B1, B2, B3, B4) which are to be brought together, and for generating a preset value for the first mentioned control device (18) on the basis of measured values of the web tension of all webs (B1, B2, B3, B4) which are to be brought together.

23. The device in accordance with claim 22, characterized in that only the second control device (18) is in a direct active connection with an actuating member (02, 05, 16) assigned to the individual web (B1, B2, B3, B4).

24. The device in accordance with claim 22, characterized in that at least a number of second control devices (18.1, 18.2, 18.3, 18.4) corresponding to the number of the whole webs (B1, B2, B3, B4) to be brought together is provided.

25. The device in accordance with claim 24, characterized in that a common first control device (19) is assigned to the number of second control devices (18.1, 18.2, 18.3, 18.4).

26. The device in accordance with claim 22, characterized in that the processing step (03) is embodied as a printing unit (03) and is provided upstream of a hopper (09) of a hopper inlet roller (08).

27. The device in accordance with claim 26, characterized in that an actual web tension at a respective measuring location (04) downstream of the printing unit (03) and a measuring location (06) upstream of the hopper inlet roller (08) are provided as input values to the second control device (18.1, 18.2, 18.3, 18.4) of the same web (B1, B2, B3, B4), and that a signal (S1.11) for controlling the

web tension upstream of the printing unit (03) involved is provided as an output value.

28. The device in accordance with claim 27, characterized in that a signal (S1.12) for controlling the web tension downstream of the printing unit (03) involved is additionally provided as an output value.

29. The device in accordance with claim 27, characterized in that a preset value of the web tension upstream of the hopper inlet roller (08) is provided to the second control device (18).

30. The device in accordance with claim 22, characterized in that the control devices (18, 19) are embodied as sub-routines or sub-programs in a software program.

31. The device in accordance with claim 22, characterized in that the control processes (18, 19) are embodied as different hardware components, which are spatially separated from each other.

32. The device in accordance with claim 22, characterized in that a memory device (21), which is connected with the control system (17) is provided, which contains starting values for controlling the web tension.